# Western North Carolina Landslide Fact Sheet

N.C. Geological Survey - 2004

## Areas susceptible to landslides

- Natural or manmade steep slopes usually greater than 30 degrees (or about 60 percent)
  - o Embankments or fills.
  - Cut or excavated slopes.
  - o Hillside depressions or hollows, especially those near streams or springs.
  - o Eroded or undercut stream or river banks.
- Areas below steep slopes, especially those near streams.
- Areas on hill or mountainsides where runoff accumulates.
- Disturbed or modified slopes on mountainsides.
- Where roads cross drainages or streams on mountainsides.

### What to do if your house is threatened by a landslide

- Leave the house and evacuate the area immediately.
- Stay away from streams, creeks and drainages.
- If you cannot leave the house, move to an upper floor.
- Notify emergency response personnel or the fire department.

## Indicators that more movement is likely following a landslide – especially following heavy rains

- Unstable material such as loose, wet soil remaining in the landslide scar\* area. Exposed, in-place bedrock in the scar and along the landslide path, however, may indicate most of the material may have already moved, and the scar area is more stable.
- Cracks in the ground allow water to infiltrate the soil and make the slope more unstable.
- Leaning or tilted trees or utility poles around the scar area.
- Water seeping or flowing from the landslide scar area.
- A terraced ("stair-stepped") ground surface around the scar area.
- Culverts, roads or blocked culverts directing runoff toward the unstable area.

#### Different Types of Slope Movements/ Some Criteria for Recognizing Potential Slope Movements

#### Landslides

Of utmost concern in the mountains of western North Carolina are landslides and rockfalls. Indicators for potentially unstable ground include the following:

- Open cracks in the surface above or on a slope.
- Cracking of the foundation of a building, retaining wall or other structure.
- Doors and windows out of plumb, or that stick or will not open and close properly.
- New cracks or bulges in pavement in roadways and sunken roadbeds.
- Soil moving away from foundations, decks or patios of a building.
- Broken or leaking water, gas or other utility lines.
- Leaning utility poles and street signs.
- Leaning, tilting or dying trees, tree roots stretched across cracks or areas of previous sliding.
- Springs, seeps or saturated ground in areas that have not typically been wet before.

<sup>\*</sup>A landslide scar is the bare surface of a slope left by the removal of earth material from where a landslide started.

#### **Rock Fall and Rock Slide**

Rock slides and rock fall usually occur along roadways, but can happen on any modified or natural rock slope. They can occur in conjunction with heavy rainfall, but can also happen during periods of freeze and thaw. Rocks slide or fall because of weakness within the rock mass.

Indicators of potential rock movement include open gaps or cracks between rock blocks; surfaces are red-brown to yellow-brown in color indicating weathering; and visible, flowing water along gaps or cracks.

## **Technical Assistance**

If you need assistance with any of these conditions following the storm, contact the state warning point at (800) 858-0368. N.C. Geological Survey geologists are on hand to offer technical assistance to local emergency management officials and can be contacted at (919) 733-2423 ext. 410.

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